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THE PLANT DISEASE REPORTER

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THE PLANT DISEASE SURVEY

DIVISION OF MYCOLOGY AND DISEASE SURVEY

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Winter injury of fruit crops, page 338, is reported by H. E. Morris from Montana and by Earle C. Blodgett from Idaho.

# PLANT DISEASES IN WESTERN WASHINGTON

Glenn A. Huber

According to growers, bean rust (Uromyces phaseoli typica) has been present in western Washington in Whatcom County for several years but has caused little injury to the crop, owing, principally, to its late appearance. This year we had heavy rainfall and high humidity during late spring and early summer and, as a result, rust became severe early in the growing season. On July 21, 1936, a field survey was made and twelve representative fields scattered throughout the county were visited. No field was free from the disease. In five fields there was a question as to whether or not any of the crop would mature sufficiently to harvest. (These five fields were checked at harvest time; one field yielded a small crop but the other four were total losses.) In four fields the lower leaves of the plants were beginning to dry up because of heavy infection but the upper portion of the plants showed only a few infections. Three fields were only slightly affected. At harvest time, it was estimated that out of the 400 acres of Blue Lake and Kentucky Wonder varieties, principally the former, the rust disease caused approximately 40 percent reduction in yield in Whatcom County during 1936.

Mangel or beet rust (Uromyces betae) occurred on mangel in western Washington, Island County, for the first time, this year. It appeared late in the season and caused little or no damage to the crop even though infection was heavy.

Plum rust (Tranzschelia pruni-spinosae) caused premature defoliation of the plum trees in several localities in the southwestern part of the State. Although the disease has occurred in previous years, it has not caused noticeable injury.

A survey of a greenhouse near Seattle revealed 31.6 percent of the young tomato plants affected with distinct symptoms of the "spotted wilt" disease.

Stem rust (Puccinia graminis) caused considerable damage to oats in western Washington this year. The disease has occurred to some extent in past years but heretofore has not caused any appreciable damage.

"English Fire" (Botrytis polyblastis) and leaf scorch (Stagonospora curtisii) on narcissus and Heterosporium leaf spot (Didymellina iridis) of bulbous iris were unusually severe in the Puget Sound area last spring, especially in unsprayed fields. The diseases were held in check where proper applications of Bordeaux-Penetrol were made.

In 1935 a canker and gall disease (Phomopsis sp.) of gardenia was found to be causing considerable damage in the greenhouses in the Puget

Sound area of western Washington. (Florists' Exchange and Horticultural Trade World, March 7, 1936, page 11.) This year the growers have held the disease well in check by careful cultural practices.

Late blight (Phytophthora infestans) was unusually severe on potato the latter part of the growing season in the upper Puget Sound area. The vines in many of the fields were completely destroyed within a few days after the fall rains began early in September.

The curly top virus was much less abundant on tomatoes and cucurbits in western Washington this season than it was in 1935. Few plantings showed evidence of the disease. (Western Washington Experiment Station, Nov. 16).

## LOSSES DUE TO LEAF ROLL IN A POTATO VARIETY TEST

O. C. Boyd

While the Green Mountain potatoes in this test were planted primarily to determine the true nature and cause of the stem-end browning in a crop of home-grown seed (a similar condition has often been observed in lots of certified seed), it was interesting to learn how the yield from seventy hills of secondary leaf roll would compare in yield with disease-free seed. Also, there was a difference of 50.4 bushels of Grade 1 per acre between the certified seed with no virus infection and seed with only 10 percent leaf roll and 3 percent mild mosaic. The results of the test emphasize the importance of using certified seed, of questioning seed that shows an appreciable amount of stem-end browning, particularly if the discoloration extends into the tuber.

Table 35. Green Mountain test at Massachusetts State College 1936

| Kind of Seed | Total yield bu. | Grade #1 | | Grade #2 | | Culls | |
|---|---|---|---|---|---|---|---|
| | | bushels | percent | bushels | percent | bushels | percent |
| Certified | 452.8 | 387.1 | 85.5 | 27.2 | 6.0 | 38.5 | 8.5 |
| Leaf-roll(100%) | 224.9 | 113.1 | 50.3 | 52.9 | 23.5 | 58.9 | 26.2 |
| Home grown* | 451.3 | 336.7 | 74.6 | 53.2 | 11.8 | 61.4 | 13.6 |

* With 10 percent leaf roll and 3 percent mild mosaic.
(Massachusetts Agricultural Experiment Station).

## VEGETABLE DISEASES IN MASSACHUSETTS IN 1936

O. C. Boyd

### Crops Damaged by Dry Weather

Among the small fruits, raspberries, grapes, and 1936-set strawberry beds showed the effects of the dry periods, grapes perhaps less than the others. Of the orchard fruits, apples undoubtedly suffered most, and

the damage was noticeably worse in orchards on the poorer types of soil. Here the injury was manifested as premature (early to mid-season) dropping of fruit, notably in winter-injured Baldwin trees; undersized fruits and foliage; leaf-scorch and premature leaf-fall; or a noticeable amount of Baldwin spot, or of drought spot (internal break-down, cork) particularly in Cortland and McIntosh.

Among the vegetables, early cabbage (the acreage of which was low anyway), early head lettuce, winter squash, and other cucurbits, peppers, carrots and spinach all were damaged by dry weather. Early potatoes and tomatoes fared rather well, but the yield of late potato varieties was lowered considerably in most parts of the State as was also the yield of many fields of onions and tobacco in the Connecticut Valley.

## Summary of Vegetable Disease Losses

BEAN: Losses from bacterial blight (*Bacterium* spp.) were negligible in green beans, but appreciable in many fields of French Horticultural in the eastern part of the State. Generally, the disease was most pronounced on farms where the growers maintained their own seed stock. Anthracnose (*Colletotrichum lindemuthianum*) also was practically unnoticeable until September on the late crop of green beans and occasional field of shell beans.

CABBAGE, CAULIFLOWER: Only one outstanding instance of the bacterial black rot (*Bacterium campestre*) was reported or observed and that occurred on late cauliflower in Leicester. The disease made rapid headway during the latter half of August and during September. An adjacent field of late cabbage showed only slight injury. Since the grower practices field and seed-bed rotations for these crops, but did not treat his seeds, it appears that the cauliflower seed was the source of the outbreak on that farm. Both club-root (*Plasmodiophora brassicae*) and the *Alternaria* leaf spot (*A. brassicae*) were decidedly less conspicuous this year, and downy mildew (*Peronospora brassicae*) which appeared during September and October was noticeable only in the eastern part of the State.

CELERY CRACKED-STEM: There are more reports of this condition this year than in most past seasons. All evidence points to high liming as being responsible for its occurrence. On a farm in Lowell where there was severe loss of Pascal celery in 1935, following heavy liming of the soil, the loss was much less this year where the grower applied both Borax and sulfate of ammonia in addition to the complete fertilizer. He had reduced the pH reading considerably with the sulfate, but he was inclined to attribute at least part of the benefit to the Borax application.

On a farm in Concord, where the soil had been limed moderately heavily in 1934 and again in 1935, there occurred a total loss of Pascal celery in half of a one-and-one-half acre field (pH of soil about 7.5) and at

least a 50 percent loss in the other half that recently had been banked (pH of soil about 6.5). In other fields on the same farm where celery was growing normally, the soil tested around pH 5.5-6. There is some evidence that the dry summers augment the bad effects of heavy liming in bringing on this cracked-stem and "paralysis", as the growers call it. We have no definite proof yet that the trouble is caused directly by boron deficiency, but demonstrations will be conducted next year on a few farms which should throw some light on the questions of cause and control.

CORN (SWEET): Smut (Ustilago zeae) was less damaging to the early plantings but about the same as usual in late fields. Rust (Puccinia sorghi) was unusually noticeable and was widespread on late plantings. Stewart's wilt (Aplanobacter stewarti) was observed as a light primary infection in only one planting this year, a field of popcorn in Hampden County planted with two-year old, locally grown seed.

CUCURBITS: The bacterial wilt (Bacillus tracheiphilus) of cucurbits was about normal in districtuion and amount of loss. It is the most damaging single disease of those crops. Some growers, however, reported better control of the striped cucumber beetle, its principal spreading agent, with rotenone sprays and dusts than with other materials in past seasons. Considerable loss from the soft fruit rot stage of this disease was observed at harvest time in several fields of winter squash, and no doubt further loss will occur in storage through the collapse of squashes that were removed from infected vines.

LETTUCE: Poor stands and uneven growth were observed in May in several fields of early lettuce due to the hold-over effect of Rhizoctonia root and stem infections that developed in the seed bed or transplant flats. Bottom rot (Rhizoctonia), drop (Sclerotinia), and Botrytis decay were less pronounced in both the early and fall plantings than in many past seasons. Downy mildew (Bremia lactucae) in either the early or the fall crop was negligible this year.

PEAS: The scattered commercial plantings of peas suffered less this spring from diseases of all kinds than in most past years. Even the root-rots were negligible. In home gardens, on the other hand, root-rots and wilt, tho perhaps less prevalent than usual, caused heavy losses in most instances.

POTATO: Rhizoctonia stem rot. Losses from missing hills and weak hills resulting from early season sprout infections were about normal or average, and amounted to as much as 10 percent of the crop in some fields.

Black leg (Bacillus phytophthorus) was more conspicuous in Irish Cobblers this year than in the average season. It varied greatly in individual fields from a trace to as much as 5 percent of the hills. It rarely is of much importance in Green Mountain and other late varieties.

Early blight (Alternaria solani) appeared to be held considerably in check by the dry weather of July and August. It caused only slight defoliation even in unsprayed or poorly sprayed fields. The most severe infections observed were in crops that appeared to be lacking in vigor, due perhaps to a shortage of fertilizer and soil moisture.

Virus diseases caused the usual slight losses in commercial fields where certified seed is used almost exclusively. However, heavy losses were observed from mosaic, leaf roll, and other virus diseases in many garden plots and small field plantings where apparently uncertified seed had been used.

TOMATO: Bacterial canker (Aplanobacter michiganense) was reported from only one field this year (Plymouth County), and Fusarium wilt (F. lycopersici) was decidedly less conspicuous than usual with only three or four cases reported and observed (Hampden and Middlesex counties). Early blight (Alternaria solani), though general in its distribution, caused somewhat less damage to both the early and the late planting than in most past seasons. Leaf spot (Septoria lycopersici), on the other hand, was distinctly more wide-spread and injurious than usual, particularly during September and October on the later plantings. Leaf-mold (Cladosporium fulvum) also caused no small amount of loss to late fields in Bristol and Plymouth counties during September and October.

TURNIP, RUTABAGA: Cercosporella leaf spot (C. albo-maculans), the principal leaf disease of turnips in this State, was decidedly more damaging to the turnip crop on Cape Cod than usual, and was somewhat more pronounced in other sections, including the hill towns of western Massachusetts, than in most years. It was clearly demonstrated on one farm on the Cape that the practice of growing turnips year after year on the same land may be extremely favorable for an outbreak of the disease. Where turnips followed an old asparagus bed, there occurred only a trace of the disease. Just across the fence in an adjoining field where turnips had been grown for several years, the defoliation was heavy, heavier on a yellow rutabaga than on the native white variety.

Alternaria leaf spot (A. brassicae) and bacterial black-rot (Bacterium campestre) of turnips were observed in most fields this year but as traces to very light infections only. Black leg (Phoma lingam) was damaging to a few fields on Cape Cod causing cankered, cracked roots sometimes followed by soft rot. Pycnidia of the causal fungus were abundant on the less advanced lesions. Very few Phoma spots on the foliage however were observed. Apparently the root infections took place quite early in the season.

TURNIP DARK CENTER: In recent years the cause of this disease has been demonstrated in other States to be boron deficiency. For years dark center has caused severe losses to growers in Cape Cod and in Berkshire

County. This year, under the supervision of R. W. Donaldson, the Agronomy Specialist and county agricultural agents, growers in those sections applied Borax to a portion of their crops. Wherever the applications had been made uniformly and as heavily as the directions indicated, nearly complete prevention of dark-center was the result. In some cases, however, the disease was too light even in the untreated plots to permit a fair comparison.

The treatment with 15 to 20 pounds of Borax per acre was satisfactorily effective whether the material was drilled in the row before seeding, along the side of the row after seeding, or sprayed over the row during emergence of the plants. One grower was thoroughly convinced that the treatment greatly improved the quality of his turnips aside from eliminating the actual dark-center discoloration. (Massachusetts Agricultural Experiment Station).

## TWO REPORTS ON DOWNY MILDEWS

PERONOSPORA TRIFOLIORUM DE BARY ON ALFALFA IN NEW MEXICO: This fungus, formerly unreported from New Mexico, was present in great abundance in numerous alfalfa fields in the Mesilla Valley. In early October, when the plants were reaching maturity, many of the upper leaves were rendered conspicuously chlorotic due to the parasitism of the fungus. Prior to harvesting in late October, heavily infected fields became pallid. It is our opinion that in many instances, the destruction from this attack was of such magnitude as to warrant harvesting a premature crop in order to obtain maximum yields. (Ivan H. Crowell, New Mexico State College of Agriculture and Mechanic Arts, Nov. 17).

PERONOSPORA EFFUSA ON SPINACH IN TIDEWATER VIRGINIA: Downy mildew has caused serious damage to about 50 percent of the spinach in the vicinity of Norfolk during the last two weeks. In many of the fields at least 30 percent of the leaf area of the plants has been killed or injured by the disease. The disease occurred about one month later this year than last year, the first signs of it being found on October 26. (Harold T. Cook, Virginia Truck Experiment Station. Nov. 23).

## LOSSES FROM FREEZING AND DROUGHT INJURY IN ARKANSAS IN 1936

V. H. Young

A very severe late freeze almost wiped out the apple crop and seriously injured other fruit crops. In northwestern Arkansas most of the growers removed what few apples survived as a check on the codling moth. No peaches were set in northwestern Arkansas and they were badly injured over the whole State.

Following the freeze, the western half, and especially the northwestern part, of the State suffered severely from drought. Even in the eastern half the cotton and corn crops were less than was expected. In spite of this, cotton yields were almost the best on record for the State.

The accompanying figures are attempts at representing the loss due to the combination of freezing and drought injury for fruit crops and to drought injury for certain annual crops. The estimates were obtained by comparing the ten-year average yield with the Crop Estimate Services figure for 1936. Since parasitic diseases were almost a negligible factor in the case of fruit crops, and since the diseases that were present on other crops were of the type which is not greatly affected by environment, this seems to be a reasonable way to get at the loss due to these weather conditions.

In the case of cotton, drought cut the yield severely in the western half of the State and caused some reduction in the eastern half. Cotton wilt was certainly more prevalent than usual. In spite of these facts the yield per acre is nearly 30 percent above the ten-year average.

| Fruit crops | Estimated loss due to drought and freezing injury |
|---|---|
| | Percent |
| Apple | 75 |
| Peach | 43 |
| Cherry | 33 |
| Grape | 10 |
| Strawberry | 40 |

| Other crops | Estimated loss due to drought |
|---|---|
| | Percent |
| Wheat | 16 |
| Oats | 13 |
| Field corn | 20 |
| Potato | 26 |
| Tomato | 75 |
| Sweet potato | 39 |
| Cotton | 5 |

(Arkansas Agricultural Experiment Station. Nov. 20).

## WINTER INJURY TO FRUIT CROPS IN WESTERN STATES

MONTANA: Winter injury to cherry trees was very severe. The loss of sweet cherry trees (Bing and Lambert) from this cause was more than 90 percent. Apples and stawberries also suffered severe damage. (H. E. Morris).

IDAHO: Winter injury, due principally to the October-November freeze in 1935, was very severe on cherry, peach, apricot, brambles, strawberries, certain grapes, and some apples in the Lewiston section and in fruit sections northward. Losses run from slight to almost complete killing of whole orchards.

In southern Idaho the injury was less severe but often ranged from 5 to 30 percent. Prunes were injured there. (Earle C. Blodgett).